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A NEW RICCIA FROM PERU*

BY ALEXANDER W. EVANS

Through the kindness of Mr. W. R. Maxon, of the United States National Museum, the writer has received for study an interesting collection of Peruvian Hepaticae, made by Messrs. O. F. Cook and G. B. Gilbert in 1915. One of the most remarkable of the species represented is the *Riccia* noted below, which seems to be undescribed. The remaining species are not yet wholly determined, so that a complete account of the collection can not be published at the present time.

Riccia bistriata sp. nov.

Plants growing in irregular patches: thallus simple or once or twice dichotomous, strap-shaped to obovate, mostly 0.5–1.5 cm. long, 2–4 mm. wide, and 0.5–0.6 mm. thick in the median portion, distinctly areolate and dull green above, a marginal band becoming bleached with age, more or less pigmented with purple below, especially toward the margin, median sulcus in the apical region only, 1–1.5 mm. long, the older portions of the thallus plane or nearly so above and convex below, gradually thinning toward the margin, where the two surfaces meet at an acute angle; ventral scales inconspicuous, hyaline, scarcely projecting beyond the margin; cells of the primary dorsal epidermis subhemispherical, the upper part soon collapsing and disappearing, leaving the basal portion in the form of a thickened shallow cup; green tissue of the usual *Riccia* type, consisting of upright rows of cells separated by narrow (usually) four-sided canals not constricted at the dorsal surface of the thallus, each row of cells usually connected longitudinally with four other rows and composed of five or six cells, the longitudinal walls common to two rows being marked by two colorless bands of thickening

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extending from the compact ventral tissue to above the middle of the uppermost green cells, united at their upper ends and sometimes at various points along their length; compact ventral tissue mostly eight to ten cells thick, composed of uniform parenchyma without oil-bodies: inflorescence (so far as known) dioicous, the antheridia not seen: spores dark brown to almost black, becoming very opaque with age, more or less angular, 110-130 μ in diameter, with a narrow, irregular and often interrupted wing-margin, 4 μ or less in width, spherical face covered over with a fairly regular reticulum formed by low ridges 3 μ or less in height, the meshes mostly 10-15 μ in diameter, plane faces with lower ridges, usually irregular but sometimes forming a more or less distinct reticulum. [FIG. 1.]

On soil, Santa Ana, 900 m. alt., June 25, 1915, *Cook & Gilbert 1481*.

The peculiar bands of thickening which are found in the walls of the green cells represent a feature which has not before been noted in the Marchantiales. In a section cut parallel with the surface of the thallus (FIG. 1, D) these bands are especially conspicuous. They appear in the form of minute circular structures situated in the walls common to two cells and projecting into the cavities, this appearance being due to the fact that the thickenings deposited by one cell correspond with those deposited by its neighbors. In most cases each cell is octagonal in section and is bounded by four other cells alternating with four air-canals. At its periphery it shows normally eight thickenings, two for each bounding cell. The thickenings are usually distinct and definitely two in number, but they sometimes have vague outlines and may be increased to three. In a section cut at right angles to the surface of the thallus (FIG. 1, E) the true form of the thickenings becomes evident. They now appear as parallel bands, running longitudinally with respect to the rows of green cells. Each pair of bands begins at or near the lower end of a row and extends upward to the cells just beneath the epidermis. A short distance above the middle of these cells the two bands coalesce and form a narrow arch. During their course they sometimes unite here and there but are usually quite free from each other.

Although thickened walls have not before been observed in the

green tissue of the Marchantiales, thick-walled cells of various types have repeatedly been noted in other parts of the thallus, especially in the more complex genera of the Marchantiaceae.

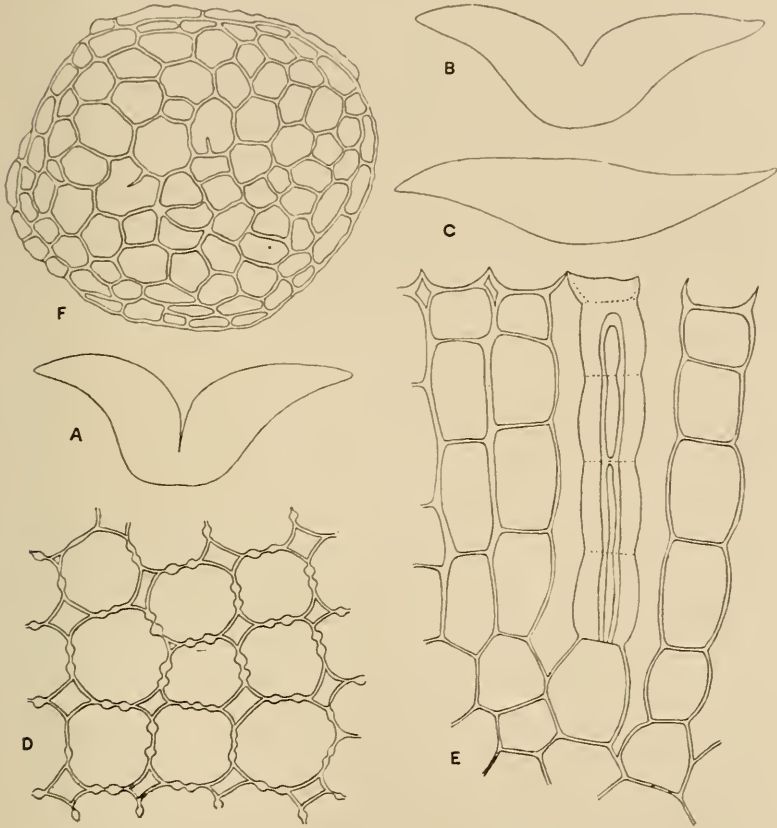


FIG. 1. *RICCIA BISTRATA* Evans.

A. Cross section of thallus in apical region, $\times 22$. B. Cross section of same thallus near basal end of median sulcus, $\times 22$. C. Cross section of same thallus in older part, $\times 22$. D. Section of green tissue parallel with surface of thallus, $\times 300$. E. Section of green tissue perpendicular to surface of thallus, showing bands of thickening in section and surface view, $\times 300$. F. Spore, $\times 400$. The figures were all drawn from the type specimen.

In addition to the tuberculate rhizoids which are of almost universal occurrence, the epidermis in many cases is distinguished by a definite cuticle and conspicuous trigones, while the cells

surrounding the pores sometimes show thickened radial walls. In the compact ventral tissue, moreover, thick-walled cells with elongated pits are not uncommon, and a number of species are known in which pointed sclerotic cells with pigmented walls can be demonstrated. Of course none of these cells bear much resemblance to the green cells of the *Riccia*. Perhaps the latter are more directly comparable with the parenchymatous cells found in the costa of *Pellia epiphylla* (L.) Corda and *P. Neesiana* (Gottsche) Limpr. Here, as in all the Jungermanniales, the gametotype is destitute of air-spaces, but the interior cells of the thallus show distinct vertical bands of thickening in their longitudinal walls. The bands, which are narrow and often pigmented, undoubtedly serve in a mechanical capacity, and the same thing is probably true of the much longer bands of *Riccia bistriata*.

According to Stephani* twenty-three South American species of *Riccia* were known in 1898, thirteen belonging to *Riccia* proper and ten to *Ricciella*. Not one of these species is accredited to Peru. In 1911 Weberbauer† was able to report two species from the vicinity of Mollendo, listing them under manuscript names of Stephani. Since these species have not been adequately published, so far as the writer knows, they need not be further considered. Among the species described by Stephani, *R. Weinionis* Steph., collected by Weinio at Rio de Janeiro, is perhaps the most closely related to *R. bistriata*. In the Brazilian species, however, the spores are smaller, measuring $102\ \mu$ in diameter, the inflorescence is described as monoicous, and the dorsal sulcus is not restricted to the apical region. It is unfortunate that Stephani makes no allusion to the anatomical features of his species, nothing being said about the epidermis, the green cells, or the compact ventral tissue.

SHEFFIELD SCIENTIFIC SCHOOL,
YALE UNIVERSITY

* Bull. Herb. Boissier 6: 310-343, 361-378. 1898.

† Engler & Drude, Vegetat. der Erde 12: 145. 1911.